GROUP 42

BODY

CONTENTS

GENERAL INFORMATION

M2420000100284

FEATURES

WEIGHT REDUCTION, HIGH RIGIDITY AND CORROSION PROTECTION

- Application ranges of high tension steel plate, antirust steel plate, and uneven thickness steel plate have been expanded.
- 12-year anti corrosion assurance due to widely used anti-corrosion steel panels
- Straight frame structure has been adopted.
- Cowl top lower panel and spring house panel are directly joined for higher rigidity.

REDUCTION OF VIBRATION, NOISE, AND AERODYNAMIC NOISE

- Curved surface of front floor pan
- Widely used accoustic foam material

IMPROVEMENTS IN SAFETY

- RISE (Reinforced Impact Safety Evolution) has been adopted for the vehicle body, corresponding to Euro NCAP* or equivalent crash test.

*Euro NCAP (European New Car Assessment Program): Crash tests (64km/h offset frontal collision, 50km/h side collision, 50km/h rear-end collision, 30km/h pole collision) performed by government (EU major countries) and consumer groups.

- Features a side door beam to boost safety upon side impact.
- Features an inside lock cable on the front door to prevent door locking due to door deformation upon frontal impact.
- One-touch power window (operative after ignition switch is turned to OFF) with safety mechanism has been installed (Front windows: standard. Rear windows: option).
- Water-proof power window switch (windows can be opened even when the vehicle goes under the water) has been installed.

IMPROVEMENTS IN OPERATION QUALITY

- When all the doors are locked, driver’s door can be opened using the driver’s side inside door handle. (Override function)
- The central door locking system, which locks/unlocks all the doors and the tailgate, is adopted (Option).
- Keyless entry system has been adopted (option).

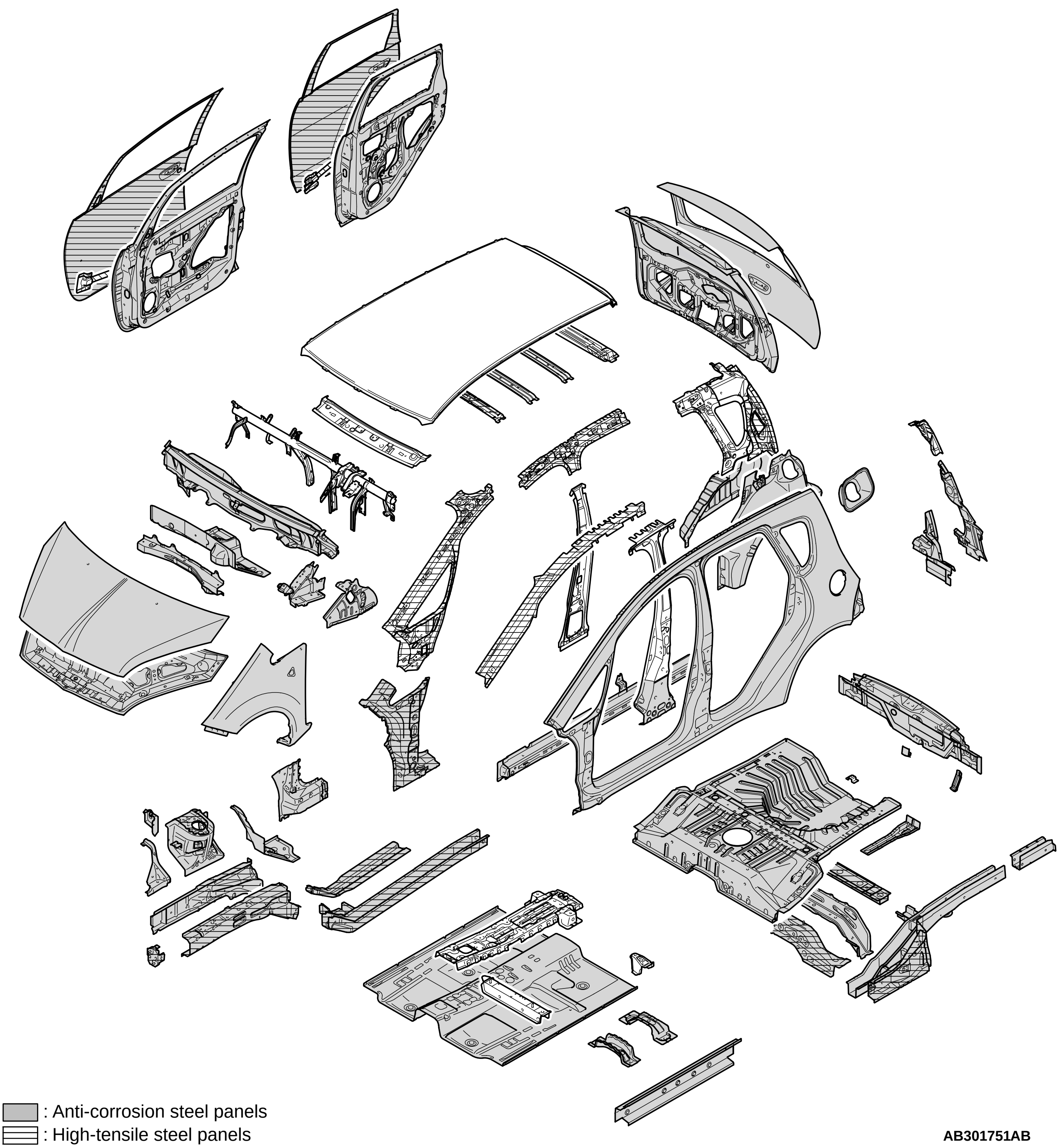
IMPROVEMENTS OF PRODUCT PACKAGE AND APPEARANCE

- By improving the engaging sound in the door latch and striker, the door locking sound has been enhanced.
- The following two types of glasses are optionally available.
  - The ultraviolet (UV) shield glasses for the front door windows, rear windows, and quarter windows.
  - The UV shield glasses for the front door windows and the privacy glasses for the rear windows, quarter windows, and a tailgate window.
- Electric sliding sunroof has been adopted (option).

MAIN BODY

BODY PANELING

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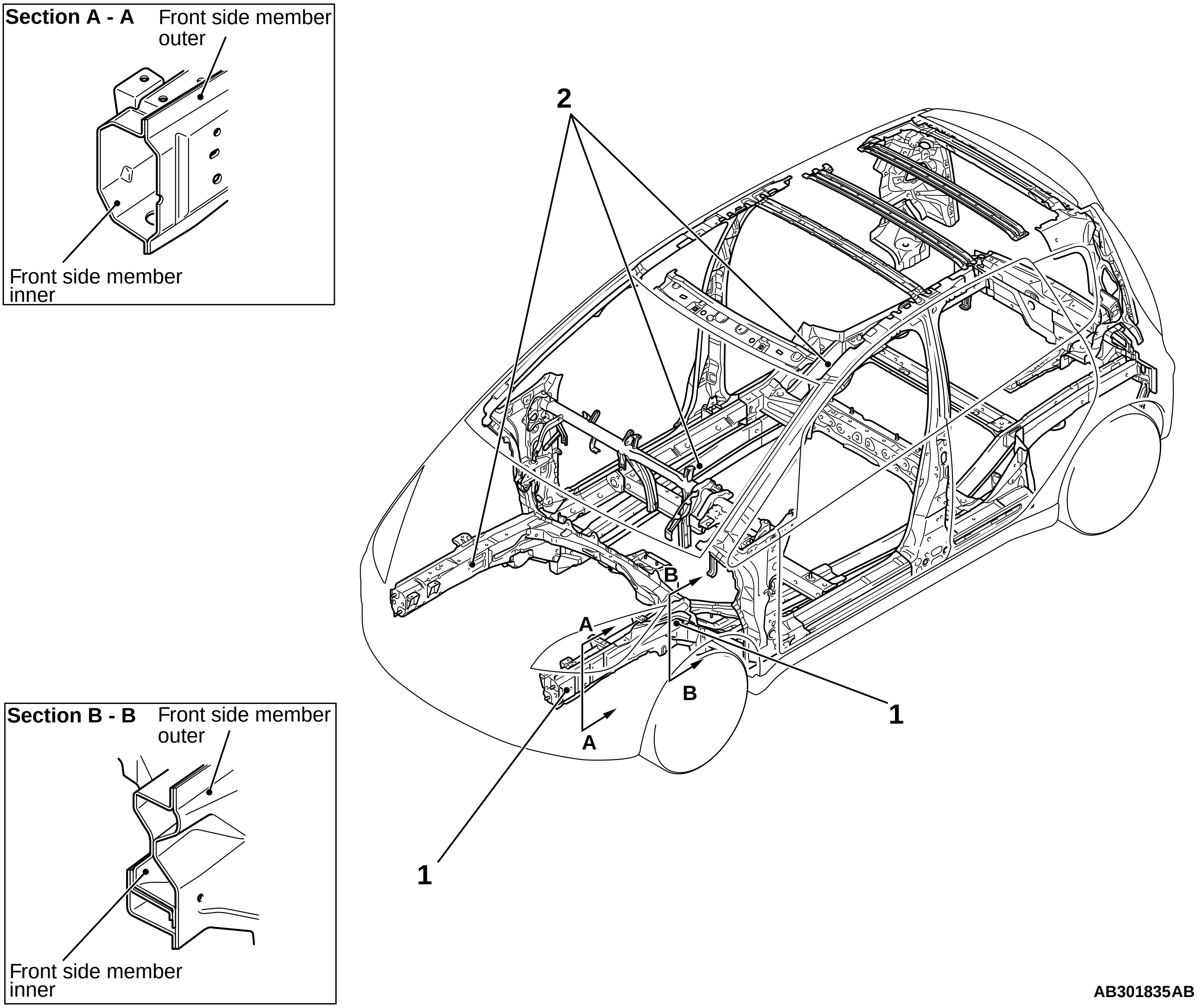


- RISE (Reinforced Impact Safety Evolution) has been adopted for the main body in order to ensure all-round impact safety at high level.
- A 12-year anti corrosion assurance is adopted due to widely used anti-corrosion steel panels
- Optimum arrangement of high-tensile steel panels realised lighter weight.

BODY SHELL

M2420003000253

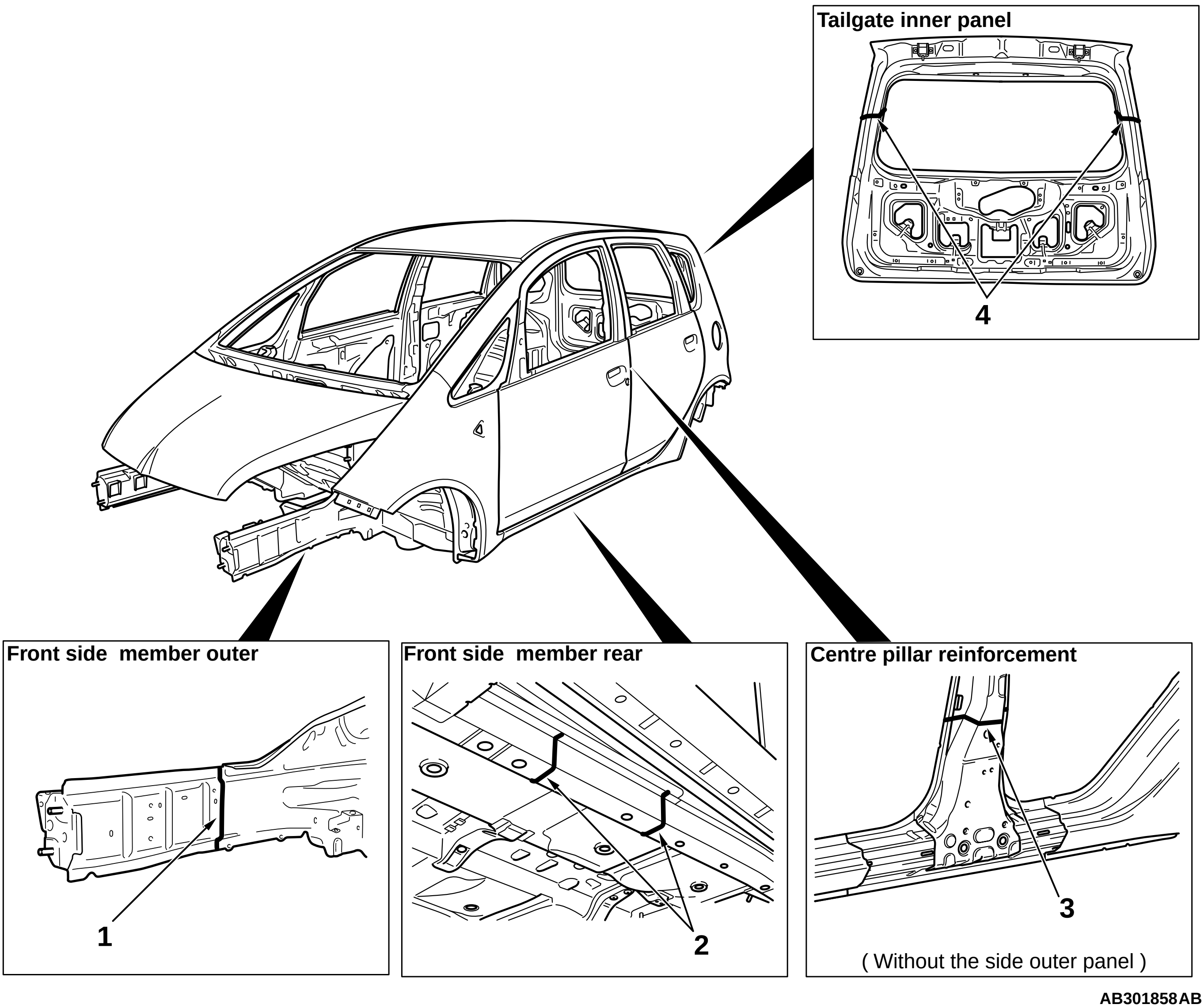
IMPACT SAFETY BODY



The front and rear structures to absorb high energy, and the highly tough cabin structure reduce the risk of passenger injuries at front-, rear-, and side-impact collisions, secure the space for life protection, and facilitate rescuing passengers. The structures also have the following features:

1. The octagonal cross section for the front of the front sidemember and 8-shaped cross section for the rear of the front sidemember have been adopted for enlargement so that the applied structures can effectively absorb energy from the impact at the time of collision.
2. Due to the adoption of straightened front side-member and the rear floor sidemember, the structure can effectively absorb energy from the impact at the time of collision.

UNEVEN THICKNESS STEEL SHEET

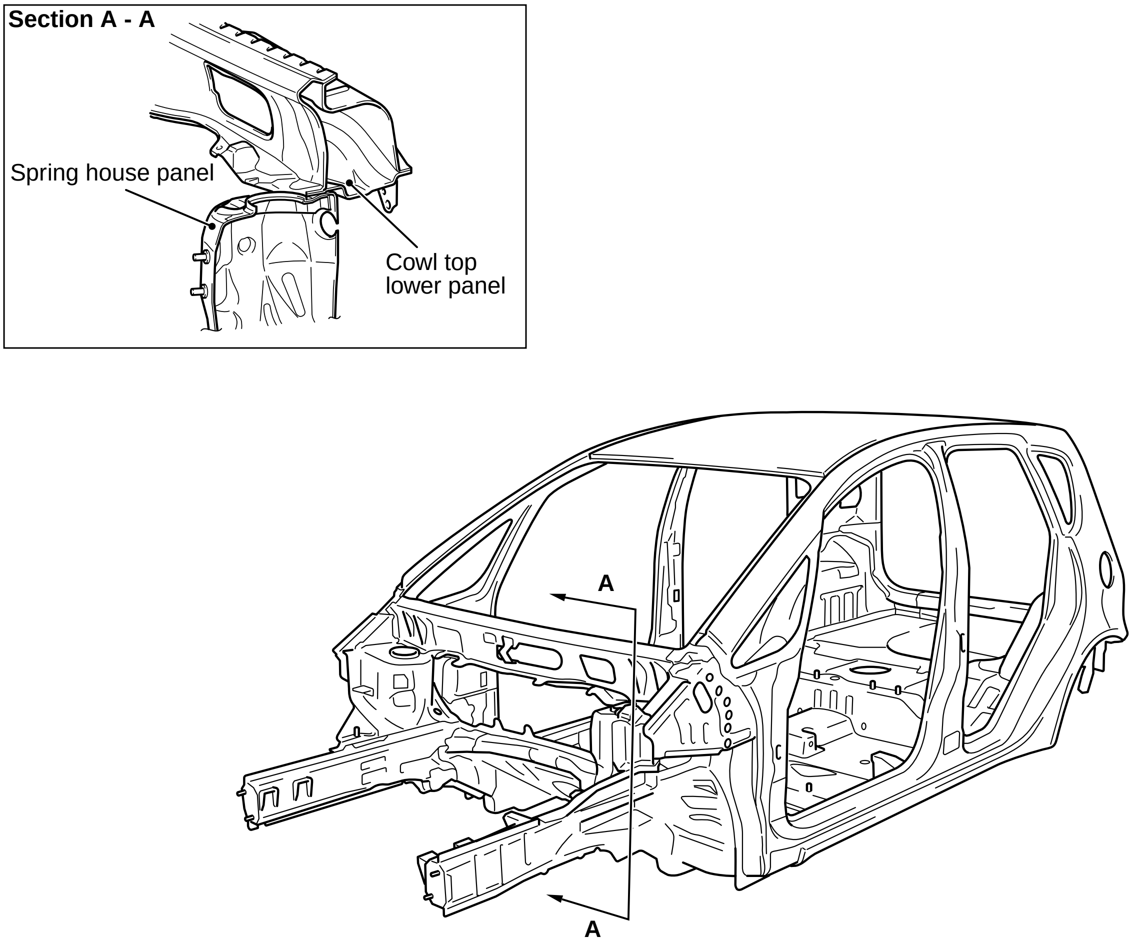


The following parts are made of an uneven thickness steel sheet*. Safety upon impact and lightness is improved with the integrated varying thickness structure.

1. The front sidemember outer is thicker at the rear.
2. The front sidemember rear is increasingly thicker toward the front of the vehicle.
3. The centre pillar reinforcement is thicker at the upper part.
4. The tailgate inner panel is thicker at the upper part.

*NOTE: *: Steel plates with different thickness welded together to make one steel plate.*

DRIVING STABILITY

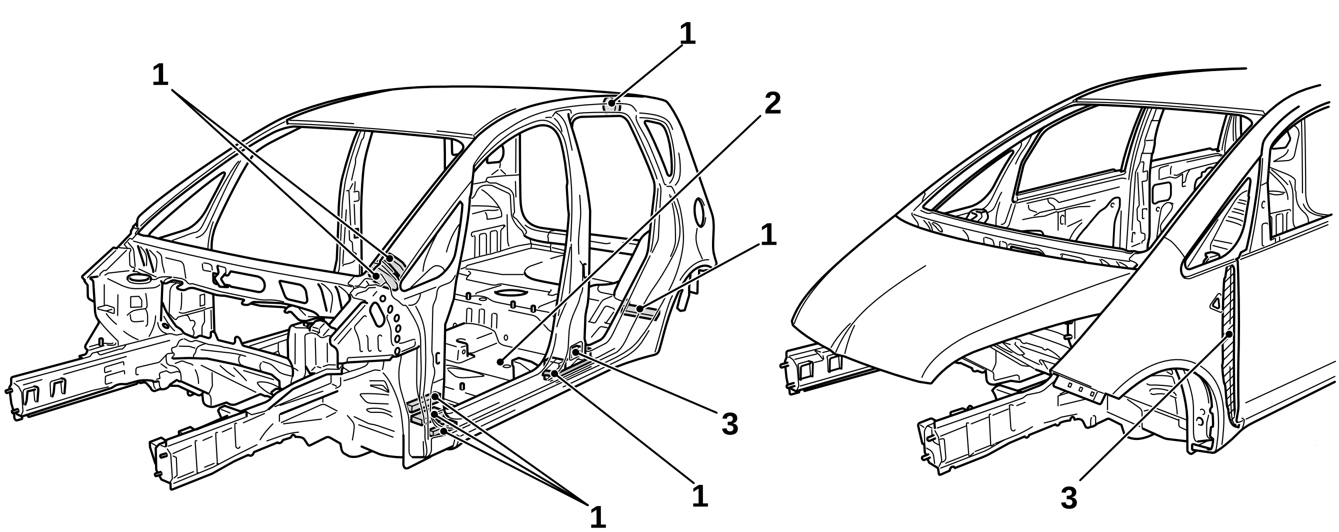


AB301859AB

- The cowl top lower panel and the spring house panel are directly joined to increase rigidity at the front suspension mounting area, thus improving the drivability.

QUIETNESS

M2420004000223



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The follwing items improve quietness.

1. Acoustic foam materials have been filled into the front pillar, the roof side rail, the centre pillar, and the inside the wheel house arch to prevent noise getting inside the vehicle.
2. The front floor pan has been curved to suppress vibration and noise.
3. Introduction of noise was prevented by inserting urethane foam inside the centre pillar and front fender.

BODY COLOUR CHARTS

M2420005000323

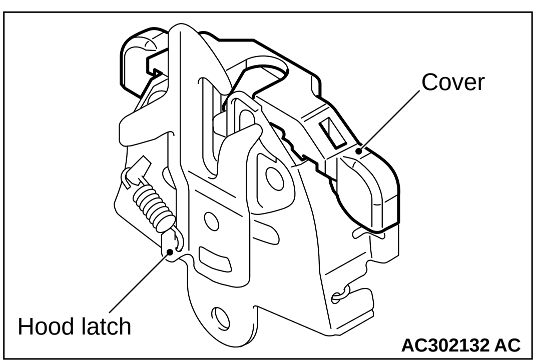
Colour	Colour code	Colour number	Colour name	Composition of film
PURE SILVER	A50	AC11150	Haag Silver	Metallic
DARK GREY	U63	AC11363	Steel Grey	Metallic
BLUE	T42	CNT10042	Aqua Grey	Pearl
BLUE	T43	CNT10043	Old China	Pearl
GREEN	G94	CNG10094	Light Green	Metallic
GREEN	G96	CNG10096	Agave	Metallic
BLACK	X19	CNX10019	Deep Black	Solid
WHITE	W16	CNW10016	New White	Solid
RED	P04	CNP10004	Amazon Red	Solid
RED	P14	CNP10014	Dark Red	Pearl
PURPLE	V04	CNV10004	Cassis	Pearl

NOTE: For painting, inner panel colours should be similar to the outer panel colours.

HOOD

M2420023000114

HOOD LATCH COVER



A cover is added to the hood latch upper part to deter thieves.

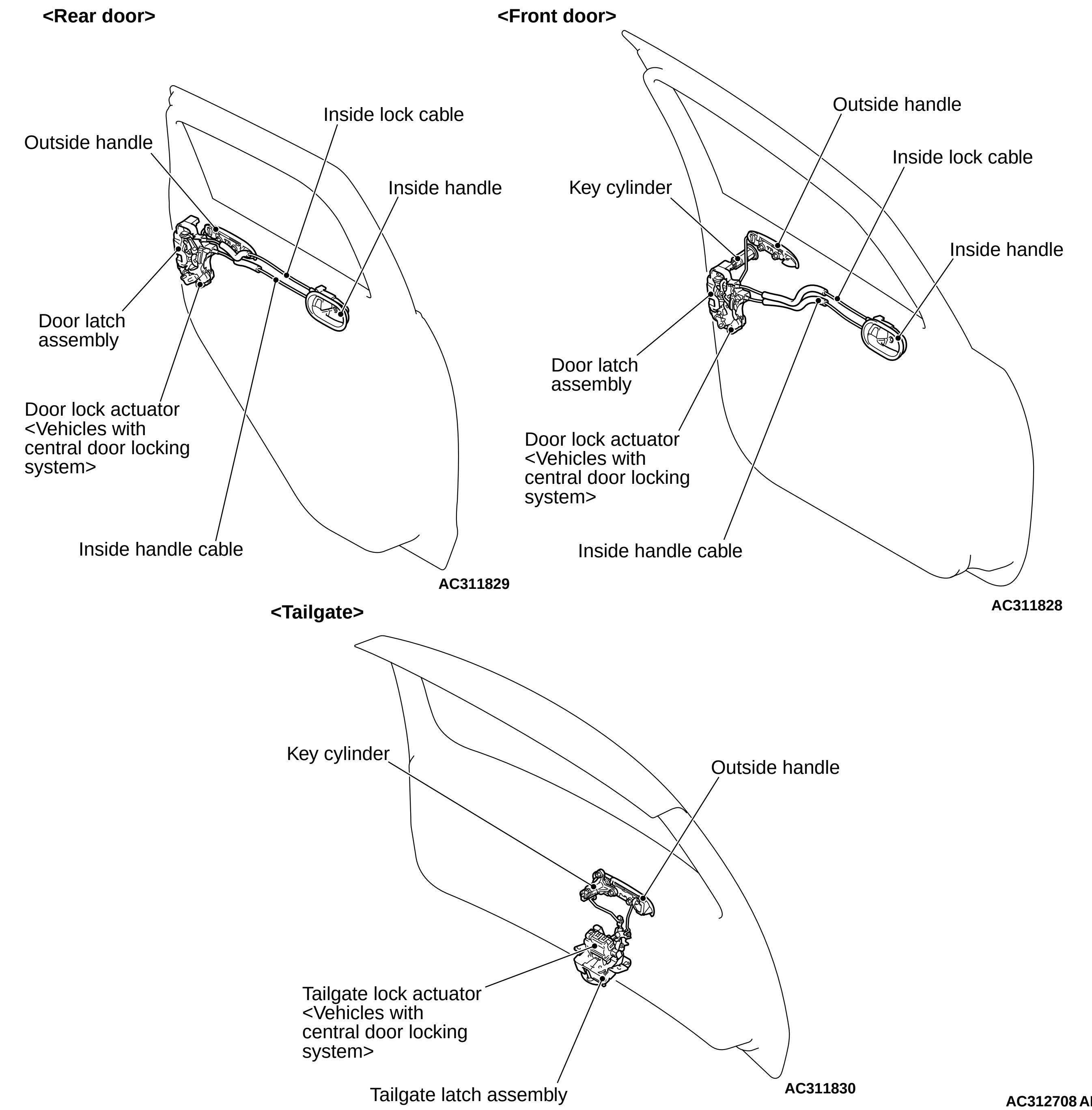
DOOR

DOOR LOCK

M2420009000251

- A centre door lock system that locks and unlocks all doors (including the tailgate) via the driver’s door key cylinder or the driver’s door inner lock knob is optionally available.
- A child protection is used to prevent the doors from being opened accidentally during driving.
- Key-in prevention function has been introduced.
- Direct combination key cylinder mechanism has been adopted.

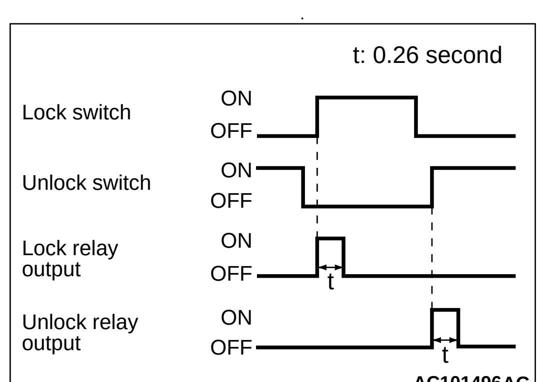
CONSTRUCTION DIAGRAM



DESCRIPTION OF STRUCTURE AND OPERATION

CENTRAL DOOR LOCKING

- All doors (including the tailgate) are locked when all of them are closed and the driver's door key cylinder or the driver's door inner lock knob is operated to the locking direction.
- The driver's door can be opened by pulling the driver's door inner handle even when the driver's door inner lock knob is in the locked position. This function is called "Override function".

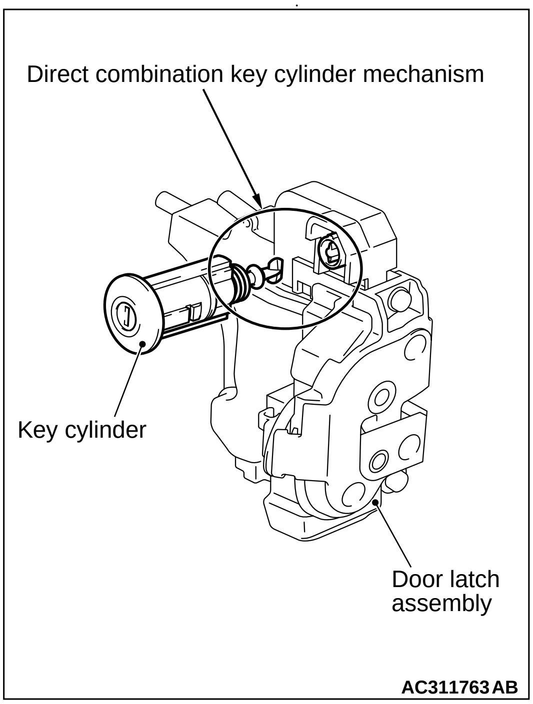


When the driver's door is locked (when the lock switch turns ON after turning OFF the unlock switch in the driver's door lock actuator), ETACS-ECU turns ON the lock relay output for 0.26 second, and locks all doors (including the tailgate). When the driver's door is unlocked (when the unlock switch turns ON after turning OFF the lock switch on the driver's door lock actuator), ETACS-ECU turns ON the unlock relay output for 0.26 second, and unlocks all doors (including the tailgate).

KEY-IN PREVENTION FUNCTION

When the driver's inner lock knob is operated to the lock position with the driver's door open, the driver's door cannot be locked, thus preventing it from being locked with the key inside the vehicle.

DIRECT COMBINATION KEY CYLINDER MECHANISM



This mechanism allows the doors not to be locked easily during side collision. Because of this, the doors can be opened after side collision.

- Even if any door key cylinder is attempted to be tampered with the doors locked, the tampering force is not easily transmitted to the door latch to deter thieves.

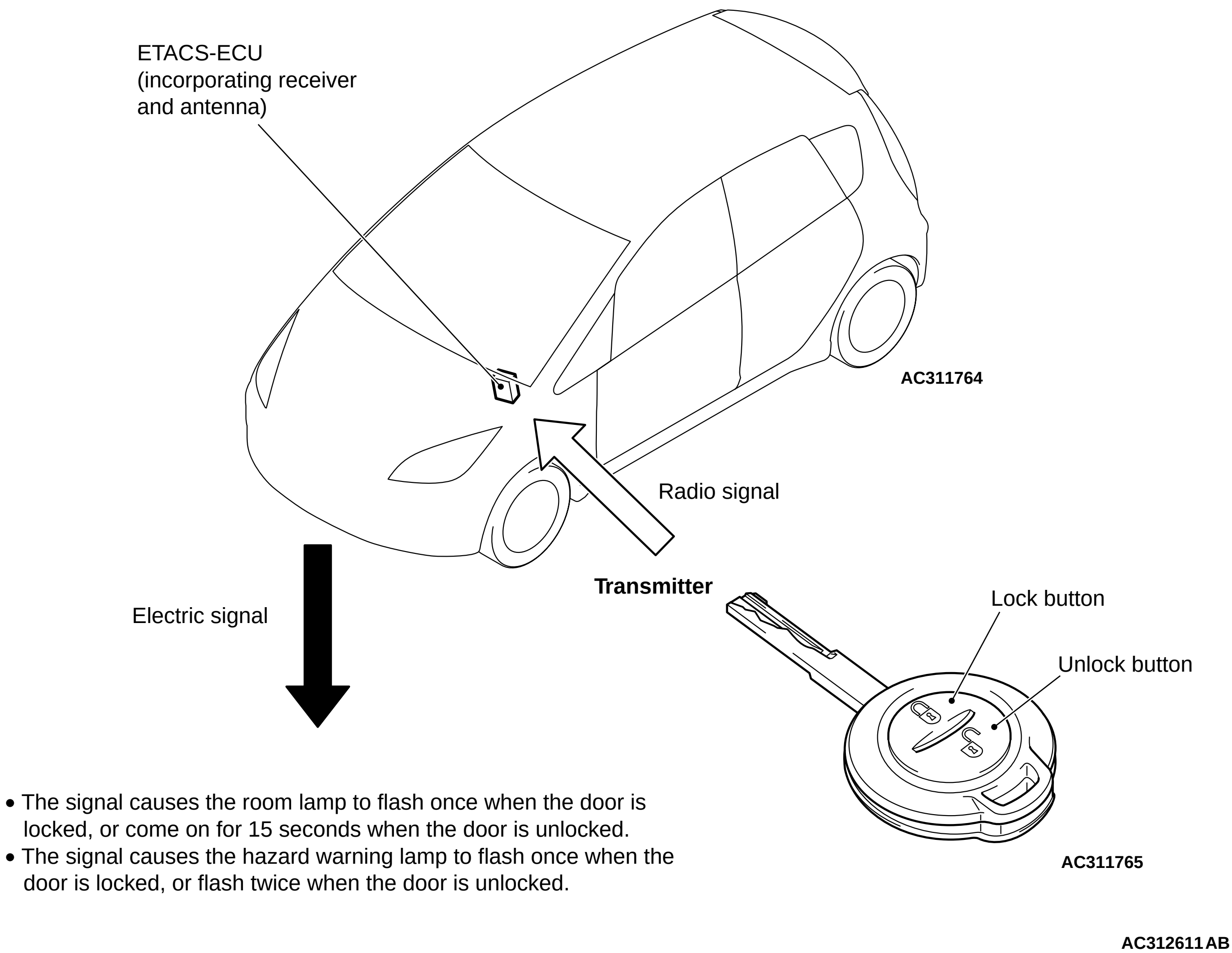
KEYLESS ENTRY SYSTEM

M2420010000266

Keyless entry system has been adopted (option). There are the following features.

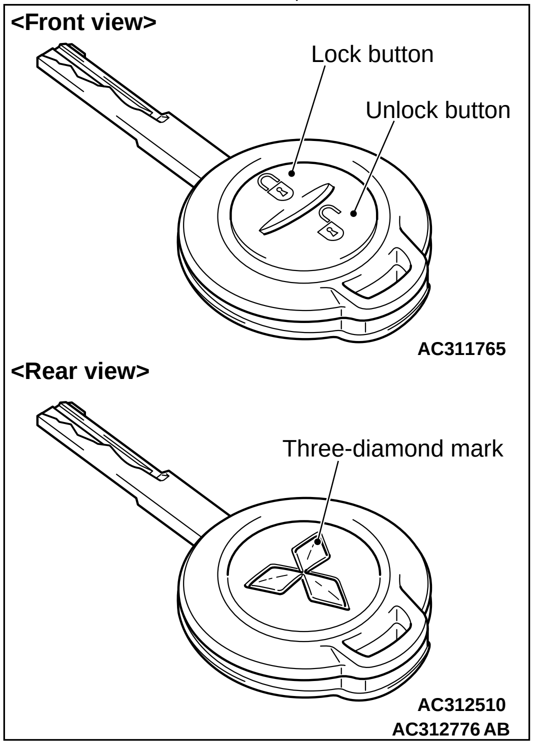
- The 2-button transmission switch type (lock/unlock buttons) transmitter which transmits the radio signal is adopted.
- The ETACS-ECU is equipped with the integral receiver and receiving antenna.
- It can memorize up to 8 secret codes using MUT-III.
- The room lamp answerback and hazard lamp answerback are adopted.
- The lock/unlock buttons can lock or unlock all doors (including the tailgate).

CONSTRUCTION DIAGRAM



DESCRIPTION OF STRUCTURE AND OPERATION

TRANSMITTER

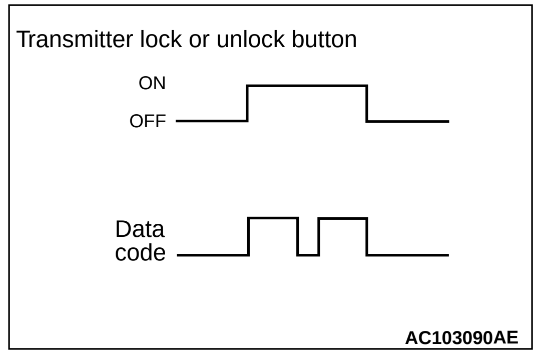


The transmitter is integrated into the master key.

- When either button is pressed, the transmitter emits a radio signal representing a specific ID code.
- There are two buttons on the transmitter; the lock button and the unlock button.
- A brilliant silver Three-diamond mark is stamped on the back side of the key grip to improve appearance.
- A coin type battery, CR2016 is used in a transmitter.
- The transmitter switch operation allows the system to operate as follows:

Operation of keyless entry system	Operation of transmitter
Lock all doors and tailgate	Lock button (pressed once)
Unlocks all doors and tailgate	Unlock button (pressed once)

SECRET CODE



The figure above shows the codes transmitted from the transmitter. Every time the button is pressed, the data code is transmitted twice. The secret code for user identification is a combination of 0 and 1, and more than 1 million different combinations are available. In addition to the secret code, the data code contains a rolling code which changes at each transmission, protecting transmission codes from theft by coping.

ETACS-ECU (RECEIVER)

- The ETACS-ECU incorporates a receiver with an antenna. The receiver compares the code sent from the transmitter with the code retained in the receiver through the antenna.
- The ETACS-ECU will send a signal to the door lock actuators only when these two codes are matched and the rolling code is correct.
- All of those output signals are processed internally in the ETACS-ECU.
- A maximum of four secret code (8 transmitters) can be registered by connecting the diagnosis connector to the MUT-III.

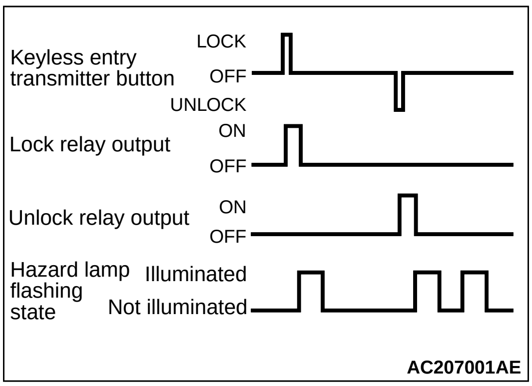
FUNCTION FOR CONFIRMING ETACS-ECU (RECEIVER) OUTPUT AND OPERATION

When the ETACS-ECU receives an radio wave signal of the identification code stored in the receiver, the ETACS-ECU outputs LOCK/UNLOCK signal and informs the driver of the keyless entry system operation by flashing the lamp. Using an adjustment function*, the number of flashing times for the hazard lamp answer-back can be changed between 0 – 7 times. The initial setting at factory for the answer-back function is as follows: "Hazard warning lamp: LOCK Flash once, UNLOCK Flash twice / Room lamp: LOCK Flash once, UNLOCK Stay on for 15 seconds."

*NOTE: *: Using an adjustment function, the hazard lamp answer-back function can be enabled/disabled. This is done by using the MUT-III.*

Item	Operation	
	Doors and tailgate locked	**Doors and tailgate unlocked**
ETACS-ECU (receiver)	Sends lock signal	Sends unlock signal
Room lamp	Flashes once	Illuminates for 15 seconds
Hazard warning lamp	Flashes once	Flashes twice

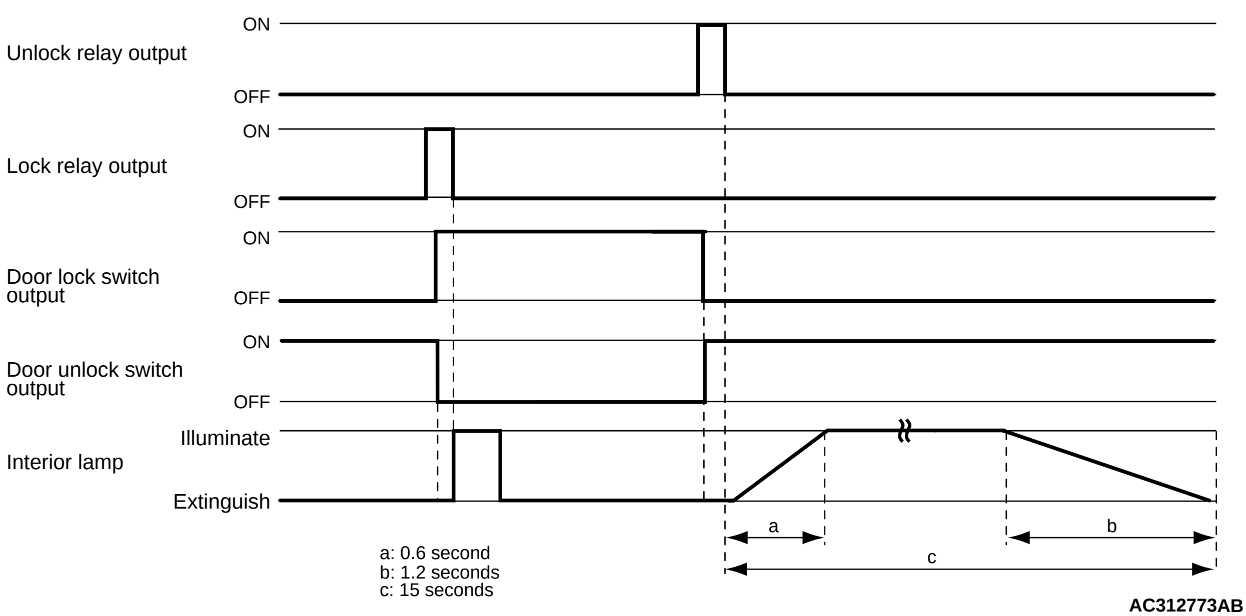
KEYLESS ENTRY HAZARD LAMP ANSWERBACK FUNCTION



When LOCK signal from the keyless entry transmitter is input to the ETACS-ECU, all doors (including tailgate) are locked and the hazard warning lamp flashes once. When UNLOCK signal is input, all doors (including tailgate) are unlocked and the hazard warning lamp flashes twice.

NOTE: Using an adjustment function, the answer-back function can be enabled/disabled. This is done by using the MUT-III.

KEYLESS ENTRY INTERIOR LAMP ANSWER-BACK FUNCTION



When LOCK signal from the keyless entry transmitter is input to the ETACS-ECU, all doors (including tailgate) are locked and the interior lamp flashes once. When UNLOCK signal is input, all doors (including tailgate) are unlocked and the interior lamp illuminates for 15 seconds. The interior lamp fades in, keeps on, and fades out in 15 seconds after the door unlock relay is operated.

KEYLESS ENTRY TIMER LOCK TIME

If any door (including the tailgate) is not opened or closed within 30 seconds after the doors (including the tailgate) are unlocked by the keyless entry system, ETACS-ECU automatically outputs the door lock signal to lock the doors (including the tailgate). This function prevents the doors (including the tailgate) from being unlocked unexpectedly by operation errors. Using an adjustment function*, the timer lock delay can be changed between 10 – 80 seconds. The initial setting at factory is 30 seconds.

*NOTE: *: Using an adjustment function, the timer lock delay can be changed. This is done by using the MUT-III.*

OPERATION INHIBITION CONDITIONS

The operation of the keyless entry system is inhibited in the following conditions.

- When the ignition key is inserted into the ignition switch.
- When either door (including the tailgate) is open (the door switch: ON). (including door ajar)

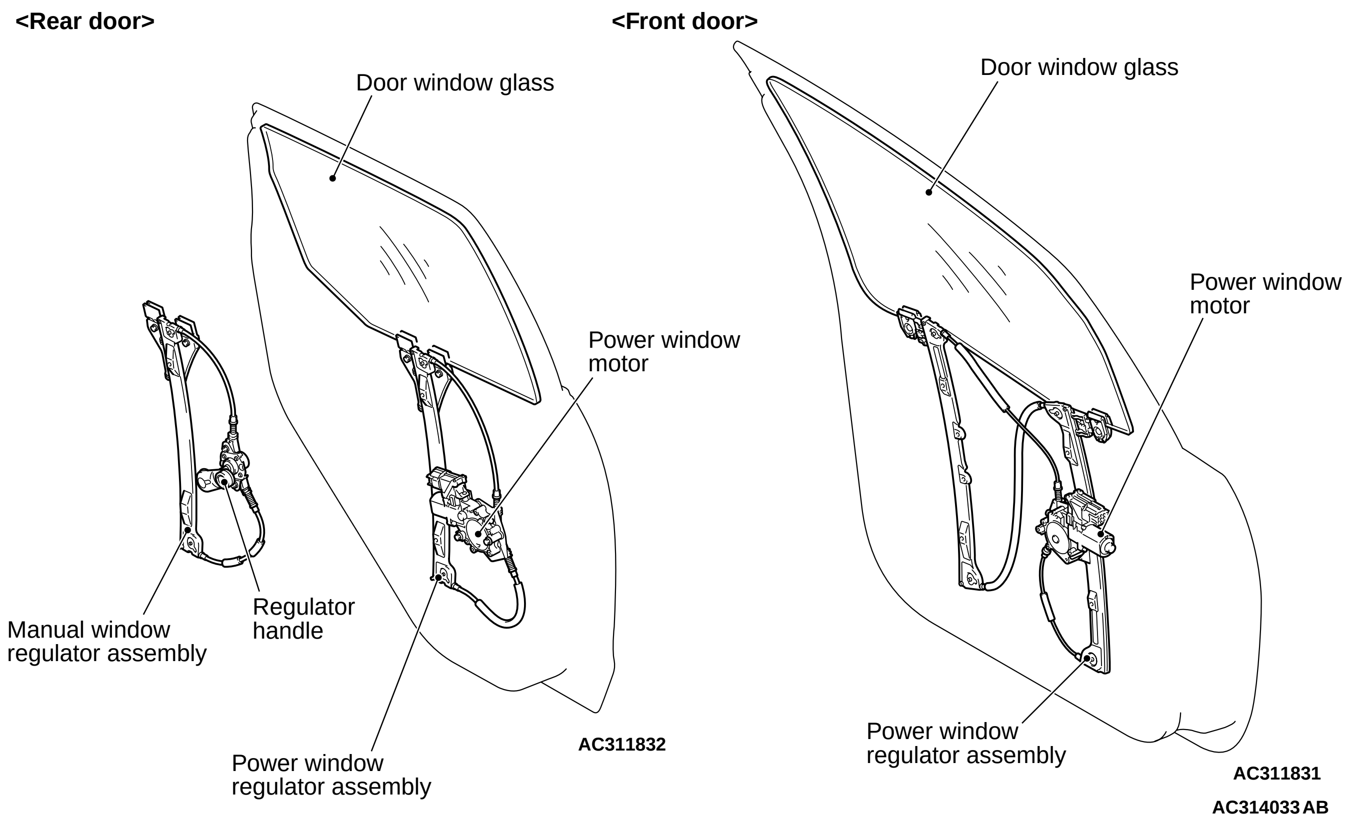
WINDOW GLASS REGULATOR

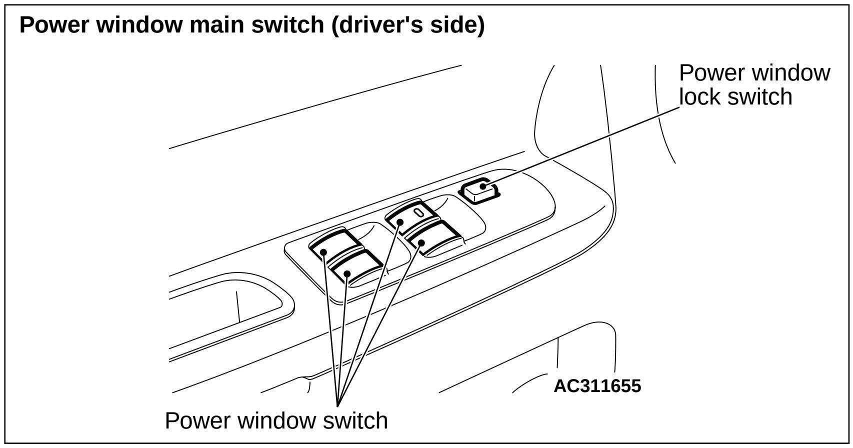
M2420011000225

The power window is standard equipment on the front doors and optionally available for the rear doors. The power window has the following features.

- New window glass regulator has been installed to the front doors.
- The new power window system is adopted. The system enables to open the power window even if the vehicle is submerged.
- The anti-trapping function is adopted.
- The power window main switch can operate each of the power windows by one-touch up and down operation.
- The power window timer function is adopted.
- The power window lock switch is adopted.

CONSTRUCTION DIAGRAM

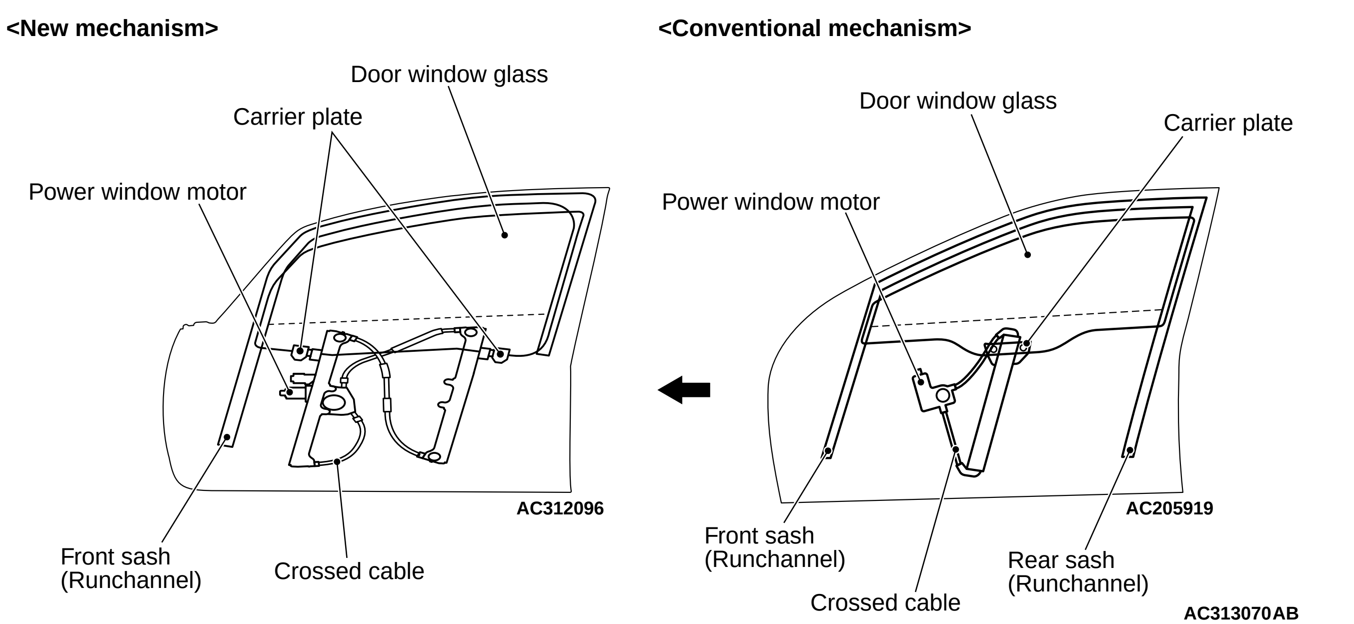




AC312213 AB

DESCRIPTION OF STRUCTURE AND OPERATION

FRONT DOOR POWER WINDOW REGULATOR



AC313070 AB

The window glasses smoothly slide up and down along the front and rear sashes.

- The window glass is supported by two carrier plates. This structure assures high rotational rigidity in the cross direction and prevents the vibration of the window glass during operation.

POWER WINDOW SYSTEM

- If the vehicle should be submerged in river or sea, each power window can be opened for a while to improve safety.

"For a while" means that the period while the operation voltage is supplied from the battery to the power windows. The duration varies depending on the severity of the submergence, battery capacity, and battery charging level.

- The power window switch has a waterproofing structure which prevents water such as rain drops from entering via the upper side. If water should be entered, it is drained through the hole located on the lower area of the switch. No water may be accumulated.

NOTE: Only if the whole switch is submerged in water, the switch determines that the vehicle is submerged.

ANTI-TRAPPING FUNCTION

The power window with the safety mechanism is adopted. If any obstacle such as a hand or a head is detected to be trapped during a window glass closing operation, the window glass is opened by approximately 150 mm to improve safety.

NOTE: If anti-trapping function is activated consecutively three times or more, the fully closed position that power window switch has learned will be erased. With this state, auto-up/down function become in effective. To make the power window switch learn the fully closed position the initialisation is required. Please refer to Workshop Manual for how to initialise.

POWER WINDOW SWITCH

The power window switch employs the push-pull operation method to improve safety. To close a door window glass, press in the switch knob, and to open, pull it up.

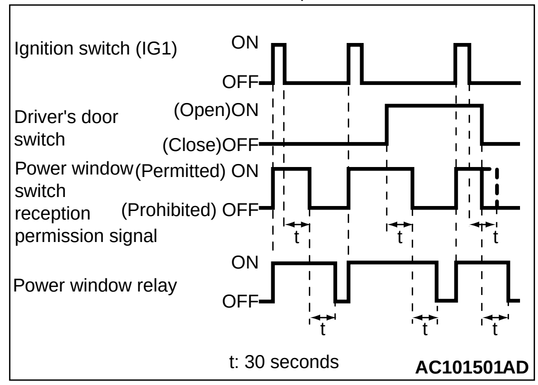
The one-touch mechanism is adopted to the driver's power window switch to fully open or close any door window glass in a single operation.

POWER WINDOW LOCK SWITCH

The driver power window switch is equipped with the lock switch. This switch inhibits the opening/closing operation of the door window glass by the front passenger's power window switch or rear power window switches.

POWER WINDOW TIMER FUNCTION

- The power window can be opened or closed by a timer function after the ignition switch is turned to the OFF position (The timer delay is extended for 30 seconds if the driver’s door is opened while the timer is on. The timer operation, however, is cancelled when the driver’s door is closed before the timer ends). Using an adjustment function*, the timer delay can be changed between 10 – 80 seconds. The initial setting at factory is 30 seconds.



The ETACS-ECU turns on the power window relay and the power window switch acceptance permission signal when the ignition switch is turned to the ON position. After the ignition switch is turned to the OFF position, the ETACS-ECU continues turning on the power window switch acceptance permission signal for 30 seconds. During this period, the power window can be operated by the power window switch. The power window relay turns OFF 30 seconds after the power window switch acceptance permission signal is turned OFF. If the driver's door is opened during the timer operation, the reception permit signal is kept ON for 30 seconds from that time. However, when the driver's door is closed, the reception permit signal is turned OFF at the same time. The power window relay turns OFF 30 seconds after the power window switch acceptance permission signal is turned OFF.

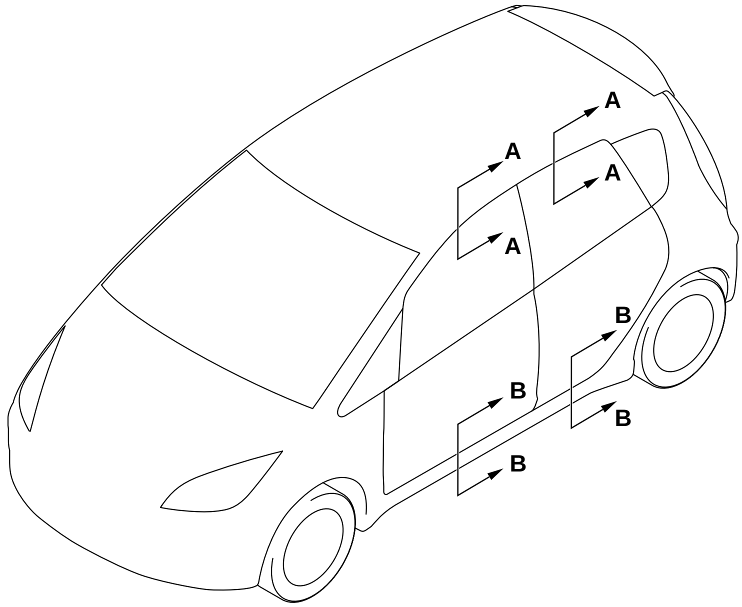
*NOTE: * Using an adjustment function, the power window timer delay can be changed. This is done by using the MUT-III.*

WEATHERSTRIP

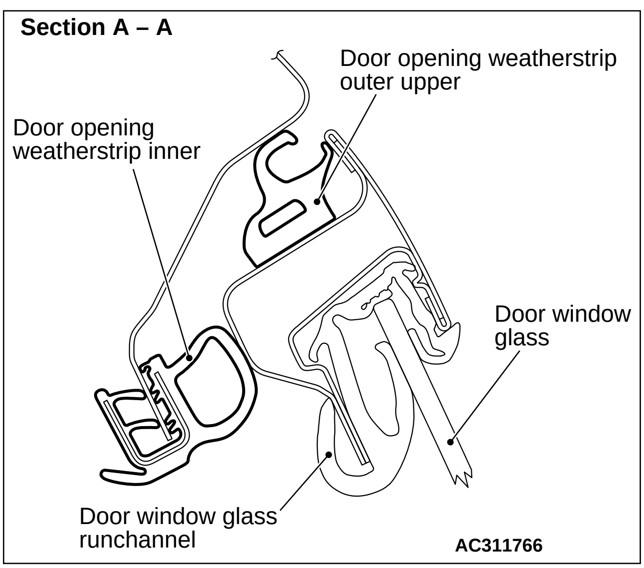
M2420020000074

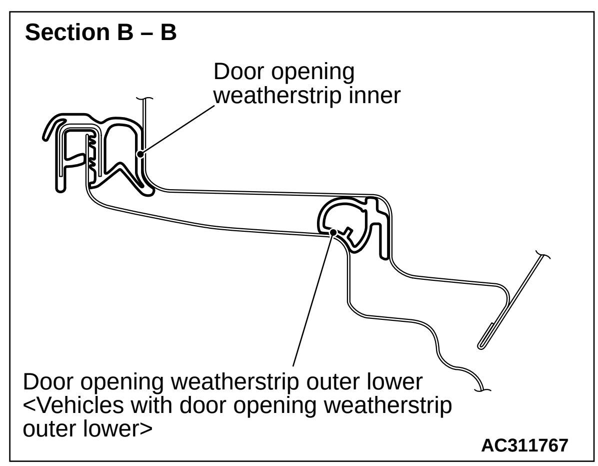
Double weatherstrips have been fitted on upper and lower edges of the doors, improving sound insulation and waterproof performances.

CONSTRUCTION DIAGRAM



AC311764





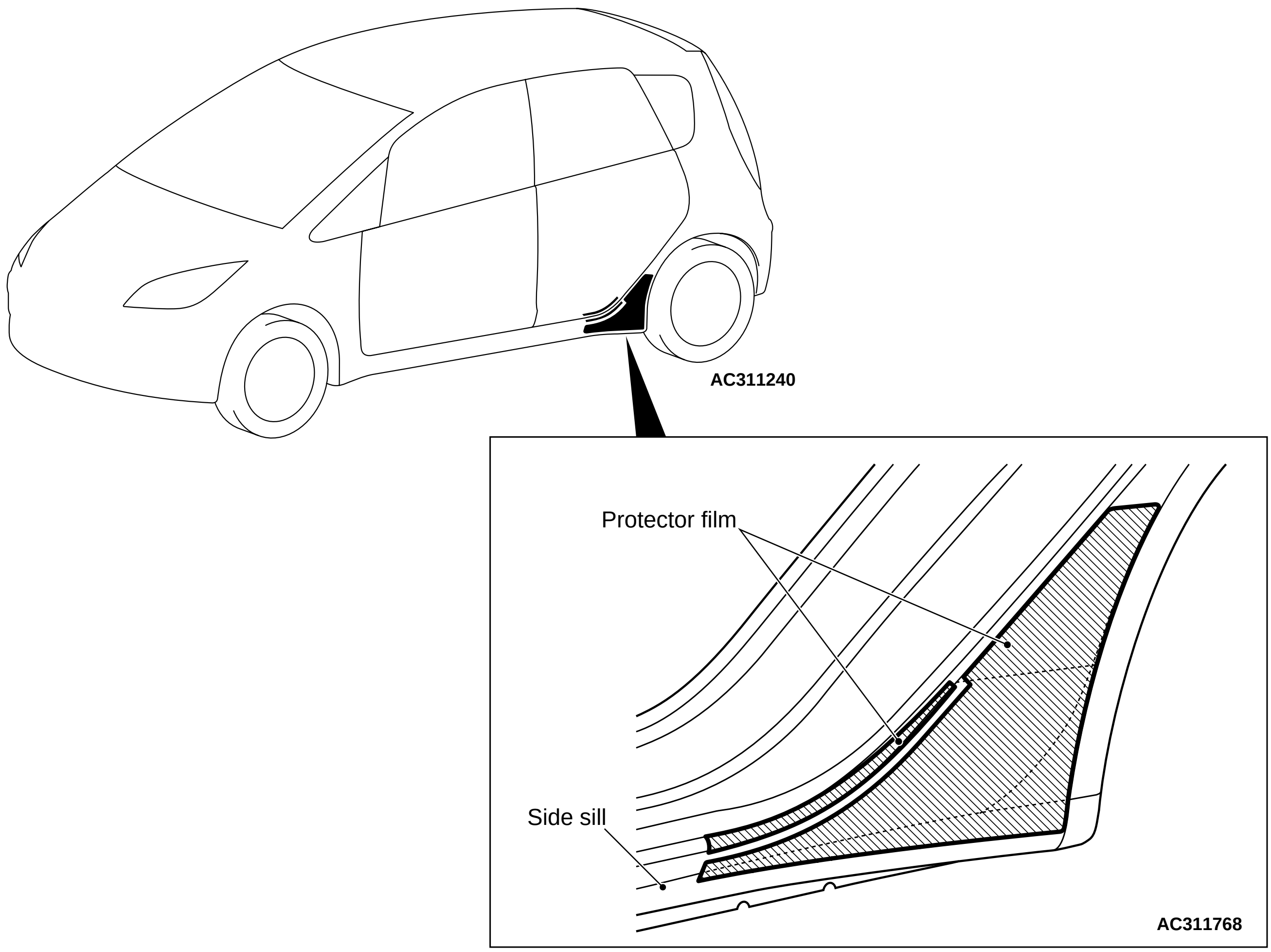
AC312612 AB

PROTECTOR FILM

M2420021000077

A protector film has been added on the lower part of the side sill to protect it against the chipping stones and prevent the paint peel.

CONSTRUCTION DIAGRAM



AC312613AB

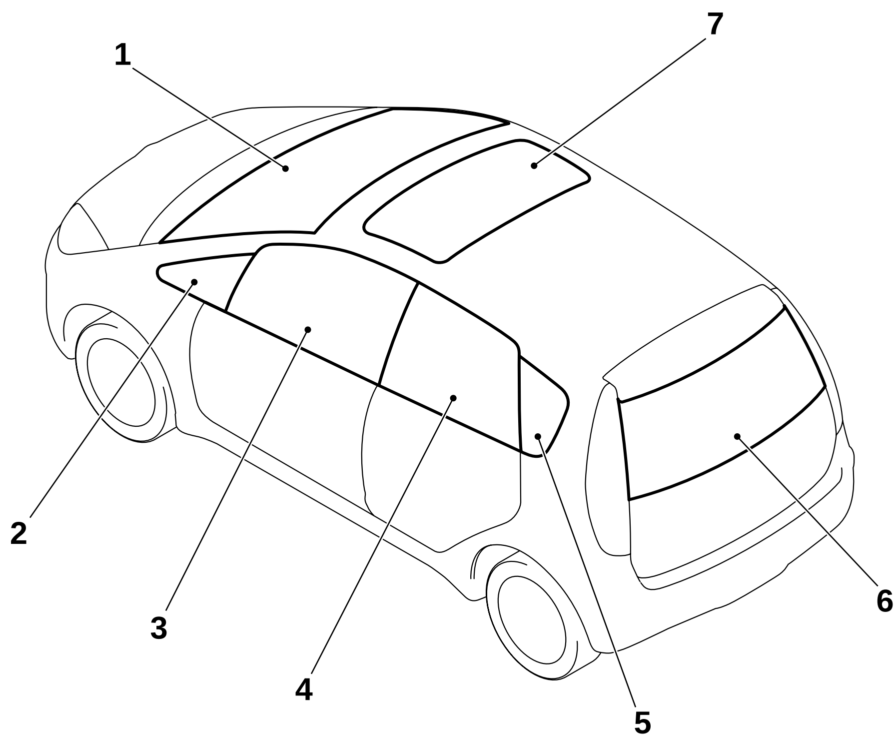
WINDOW GLASS

M2420015000346

The windshield is laminated glass and the other glass is made of reinforced glass. The following two types of glasses are optionally available.

- The ultraviolet (UV) shield glasses for the front door windows, rear windows, and quarter windows (option).
- The UV shield glasses for the front door windows and the privacy glasses for the rear windows, quarter windows, and a tailgate window (option).

VISIBLE LIGHT PERMEATION RATE OF GLASS



AC311769AB

No.	Name	Type	Thickness (mm)	Colour	Visible light permeation rate (%)
1	Windshield	Laminated glass	4.46	Green	80
2	Delta window glass	Tempered glass	3.1	Green	80
3	Front door window glass		3.1	Green	80
				Green (UV shield glass)	70.5
4	Rear door window glass		3.1	Green	80
				Green (UV shield glass)	70.5
				Dark grey (privacy glass)	35.5
5	Quarter window glass		3.1	Green	80
				Green (UV shield grass)	70.5
				Dark grey (privacy glass)	35.5
6	Tailgate window glass		3.5	Green	78
				Dark grey (privacy glass)	31.5
7	Roof lid glass		4.0	Dark grey	10

NOTE: The visible light permeation rate (%) is a reference value.

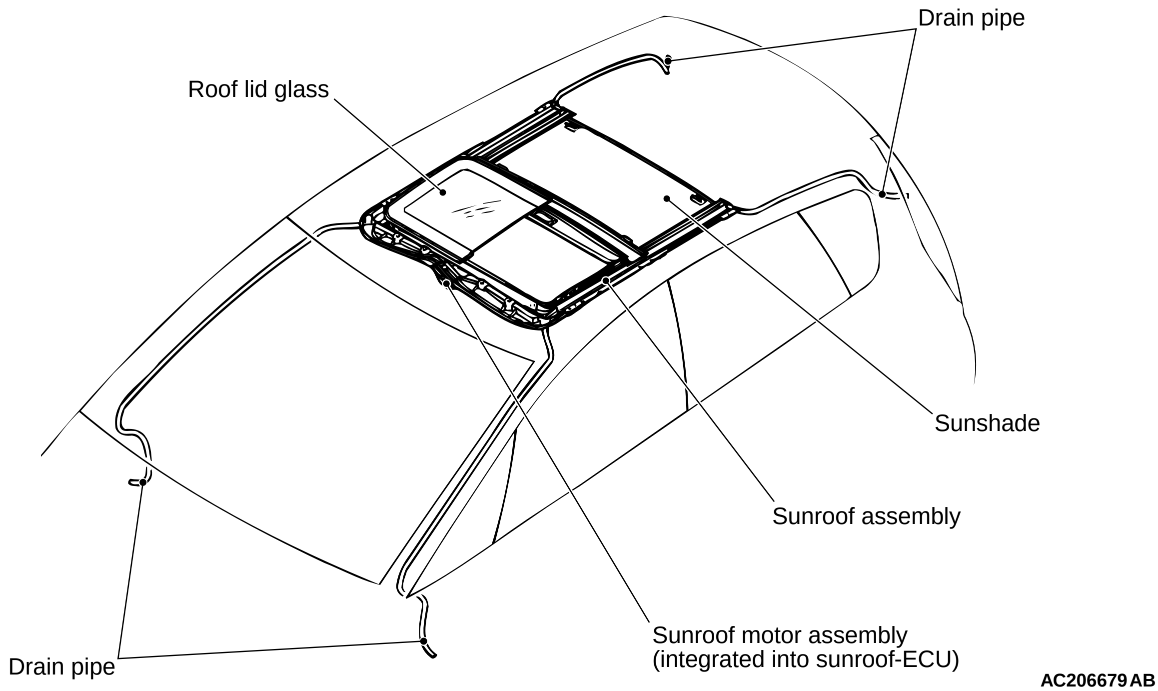
SUNROOF

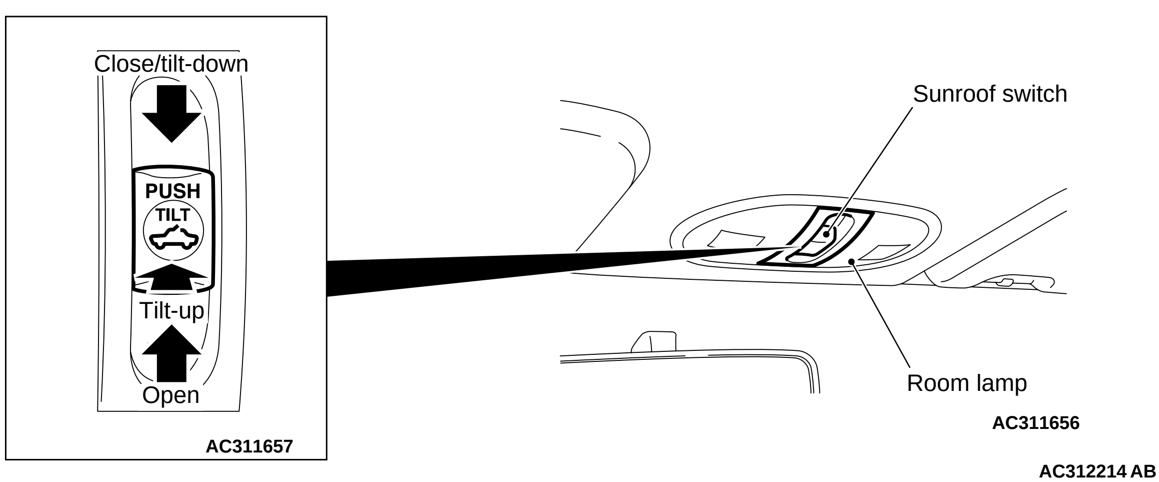
M2420016000190

Electric sliding glass sunroof with tilt-up mechanism has been adopted (option). This sunroof features the following characteristics.

- Lightweight sunroofs have been adopted.
- The sunroof tilts up for approx. 30mm to improve ventilation performance.
- The integrated switch allows for all slide open/close, tilt up/down and stop operations. All operations are available at one touch.
- If external force is applied during slide closing or tilt down operations that obstructs operations, then the roof lid glass will reverse and stop according to the jam prevention mechanism.

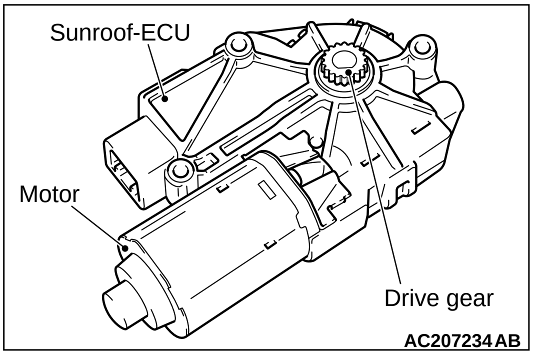
CONSTRUCTION DIAGRAM





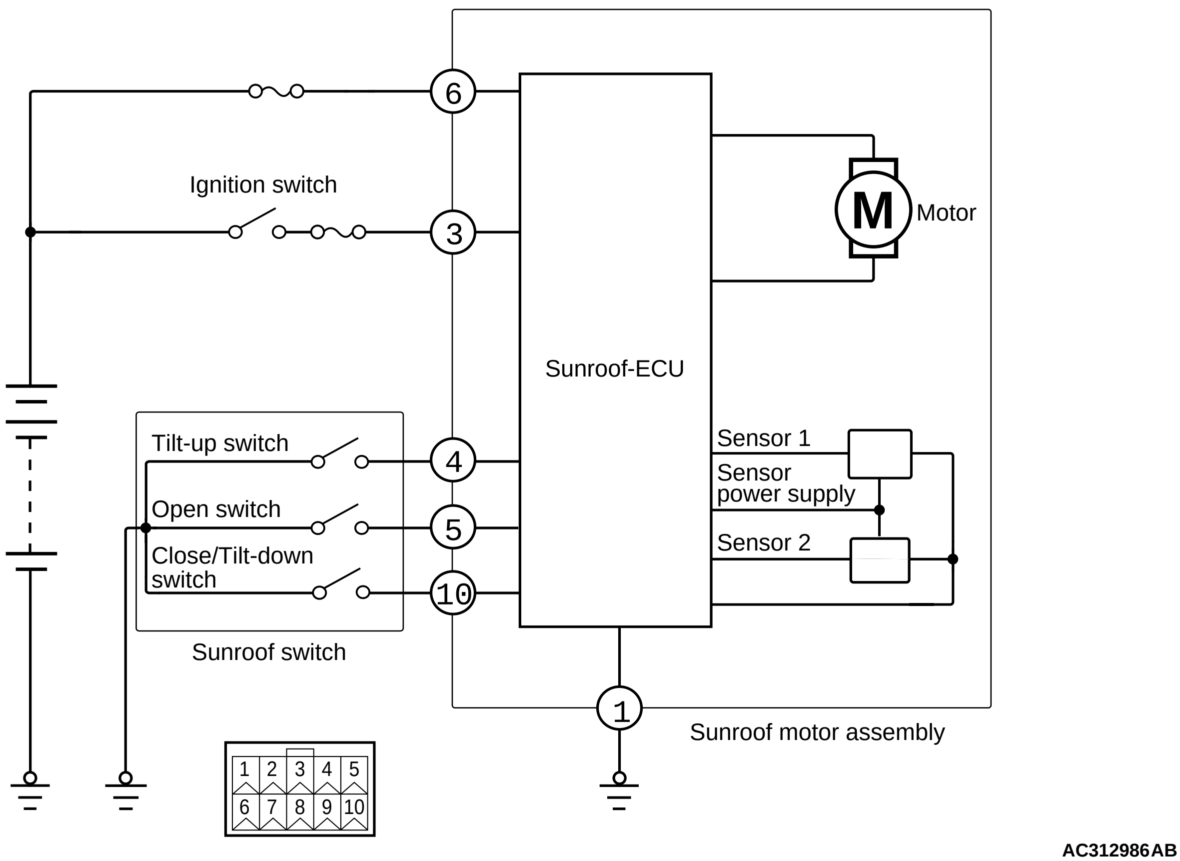
DESCRIPTION OF STRUCTURE AND OPERATION

SUNROOF MOTOR ASSEMBLY



The sunroof motor, which consists of the motor body, drive gear, and sunroof ECU, is installed in front of the housing.

SUNROOF-ECU



The sunroof ECU incorporates a microcomputer and controls various motor operations based on the sunroof switch signals.